ELSEVIER

Volumes 162–163, 15 May 2005

Journal of
Materials
Processing
Technology

www.elsevier.com/locate/jmatprotec

Contents

WORLDWIDE CONGRESS ON MATERIALS AND MANUFACTURING ENGINEERING AND TECHNOLOGY xiii

ORGANISERS OF THE CONGRESS xiii

INTERNATIONAL HONORARY COMMITTEE OF THE CONGRESS xiii

STEERING COMMITTEE OF THE CONGRESS xiv

SECRETARIAT OF THE CONGRESS xiv

REVIEWERS COMMITTEE OF THE CONGRESS xiv

8th INTERNATIONAL SCIENTIFIC CONFERENCE ON ADVANCES IN MATERIALS & PROCESSING TECHNOLOGIES xvi

INTERNATIONAL ADVISORY COMMITTEE OF THE CONFERENCE xvii

CONFERENCE ORGANISING TEAM xviii

13th INTERNATIONAL SCIENTIFIC CONFERENCE ON ACHIEVEMENTS IN MECHANICAL MATERIALS ENGINEERING xviii

PROGRAMME COMMITTEE OF THE CONFERENCE xviii

CONFERENCE ORGANISING TEAM xx

Preface 1
L.A. Dobrzański

Changes in the structure of alloy on the matrix of FeAl intermetallic phase after primary crystallization and homogenizing treatment 4
J. Cebulski, S. Lalik

Micro-frictional dissipation in fiber-reinforced ceramic matrix composites and interfacial shear estimation with a consideration of uneven fiber packing 9
C. Cho, E.Y. Choi, H.G. Beom, C.B. Kim

The publisher encourages the submission of articles in electronic form thus saving time and avoiding rekeying errors. A leaflet describing our requirements is available from the publisher upon request.

CONTENTS direct

This journal is part of **ContentsDirect**, the ***free*** alerting service which sends tables of contents by e-mail for Elsevier books and journals. You can register for **ContentsDirect** online at: **http://contentsdirect.elsevier.com**

Elsevier B.V.

Microstructure of Ni(Cr)–TiC–Cr_3C_2–Cr_7C_3 composite powder 15
G. Dercz, B. Formanek, K. Prusik, L. Pająk

Soft magnetic nanocomposite with powdered metallic ribbon based on cobalt and polymer matrix 20
L.A. Dobrzański, R. Nowosielski, A. Przybył, J. Konieczny

Structure, properties and corrosion resistance of PM composite materials based on EN AW-2124 aluminum alloy reinforced with the Al_2O_3 ceramic particles 27
L.A. Dobrzański, A. Włodarczyk, M. Adamiak

Al–FeAl–TiAl–Al_2O_3 composite with hybrid reinforcement 33
A. Dolata-Grosz, B. Formanek, J. Śleziona, J. Wieczorek

An experimental study on the behavior of glass–epoxy composite at low strain rates 39
F. Fereshteh-Saniee, G.H. Majzoobi, M. Bahrami

Intermetallic alloys with ceramic particles and technological concept for high loaded materials 46
B. Formanek, S. Jóźwiak, B. Szczucka-Lasota, A. Dolata-Grosz, Z. Bojar

Investigations of the influence of compatibilizer and filler type on the properties of chosen polymer blends 52
A. Gnatowski, J. Koszkul

Influence of milling parameters on the manufacturing of Fe–TiCN composite powders 59
E. Gordo, B. Gómez, E.M. Ruiz-Navas, J.M. Torralba

Manufacture and multiaxial test of composite tube specimens with braided glass fiber reinforcement 65
W. Hufenbach, W. Błażejewski, L. Kroll, R. Böhm, M. Gude, A. Czulak

Adhesive wear behaviour of B_4C and SiC reinforced 4147 Al matrix composites (Al/B_4C–Al/SiC) 71
R. Ipek

A tensile impact apparatus for characterization of fibrous composites at high strain rates 76
G.H. Majzoobi, F.F. Saniee, M. Bahrami

Development of collapsible PET water fountain bottles 83
S.H. Masood, V. KeshavaMurthy

The influence of extrusion variables on the interfacial adhesion and mechanical properties of recycled PET composites 90
A.L.F. de Moura Giraldi, R.C. de Jesus, L.H.I. Mei

The assessment of possibilities for utilisation of composites with thermosetting matrix 96
J. Myalski, J. Śleziona

Performance development requirements for elastomers of electric power network insulators 102
F. Noronha, J.M.G. Angelini, N.C. Góis, L.H.I. Mei

Change in injection moulded parts shrinkage and weight as a function of processing conditions 109
P. Postawa, J. Koszkul

NiTi SMA production using ceramic filter during pouring the melt 116
O.D. Rigo, J. Otubo, C.M. Neto, P.R. Mei

Ultrasonic methods in diagnostics of epoxy–glass composites 121
M. Rojek, J. Stabik, G. Wróbel

The structure and properties of sinters produced from composite powders Al–Al_2O_3–Al_3Fe–Al_3Ti 127
J. Śleziona, M. Dyzia, J. Myalski, J. Wieczorek

Deformation behaviour of an AS21 alloy reinforced by short Saffil fibres and SiC particles 131
Z. Trojanová, Z. Száraz, J. Lábár, P. Lukáč

A methodology for the prediction of standard steady-state wear coefficient in an aluminium-based matrix composite reinforced with alumina particles 139
L.J. Yang

Structure and properties of the composite materials consisting of the nanocrystalline $Fe_{73.5}Cu_1Nb_3Si_{13.5}B_9$ alloy powders and polyethylene 149
B. Ziębowicz, D. Szewieczek, L.A. Dobrzański, J.J. Wysłocki, A. Przybył

Application of Incremental Forming process for high customised medical product manufacturing 156
G. Ambrogio, L. De Napoli, L. Filice, F. Gagliardi, M. Muzzupappa

Influence of the anodic oxidation on the physicochemical properties of the Ti6Al4V ELI alloy 163
W. Chrzanowski, J. Szewczenko, J. Tyrlik-Held, J. Marciniak, J. Zak

An overview of advanced materials for hydrogen storage 169
E. David

Characterization of a $Ni_{50}Ti_{50}$ shape memory strip produced by twin roll casting technique 178
T. Goryczka, P. Ochin

Preparation of materials based on Ti–Si–C system using high temperature–high pressure method 184
L. Jaworska, L. Stobierski, A. Twardowska, D. Królicka

Influence of strip materials on behavior of incremental in-plane bending 190
Y. Jin, T. Kuboki, M. Murata

Biomechanical analysis of stent–oesophagus system 196
W. Kajzer, M. Kaczmarek, J. Marciniak

Crystallization in $Fe_{76}X_2B_{22}$ (X = Cr, Zr, Nb) amorphous alloys 203
M. Karolus, P. Kwapuliński, D. Chrobak, G. Haneczok, A. Chrobak

Corrosion resistance of intramedullary nails used in elastic osteosynthesis of children 209
A. Krauze, A. Zięebowicz, J. Marciniak

Temperature of nanocrystallisation of magnetically soft alloys for high-temperature applications 215
T. Kulik, J. Ferenc, M. Kowalczyk

Microstructure of rapidly solidified Cu–Al–Ni shape memory alloy ribbons 220
G. Lojen, I. Anžel, A. Kneissl, A. Križman, E. Unterweger, B. Kosec, M. Bizjak

Comparison of structure and properties of the HS12-1-5-5 type high-speed steel fabricated using the pressureless forming and PIM methods 230
G. Matula, L.A. Dobrzański, A. Várez, B. Levenfeld, J.M. Torralba

Study and development of LDPE/starch partially biodegradable compounds 236
E.M. Nakamura, L. Cordi, G.S.G. Almeida, N. Duran, L.H.I. Mei

Ferromagnetic properties of polymer nanocomposites containing $Fe_{78}Si_9B_{13}$ powder particles 242
R. Nowosielski, J.J. Wysłocki, I. Wnuk, P. Sakiewicz, P. Gramatyka

The material property basis of bottle blowing and balloons: stable axisymmetric aneurisms 248
J.W.H. Price

Influence of structure on the evolution of magnetic and mechanical properties of amorphous and nanocrystalline $Fe_{85.4}Hf_{1.4}B_{13.2}$ alloy 254
D. Szewieczek, S. Lesz

A study on nano-deformation behavior of rheo-formed Al–Si alloy based on depth-sensing indentation with three-dimensional surface analysis 260
S.W. Youn, P.K. Seo, C.G. Kang

Structure and mechanical properties of DP-type and TRIP-type sheets obtained after the thermomechanical processing 267
J. Adamczyk, A. Grajcar

Chemical etching of Cu-ETP copper 275
O. Çakır, H. Temel, M. Kiyak

Enhancement of liquid phase sintering through Al–Si additions to Al–Cu systems 280
M.L. Delgado, E.M. Ruiz-Navas, E. Gordo, J.M. Torralba

Properties of vacuum sintered duplex stainless steels 286
L.A. Dobrzański, Z. Brytan, M.A. Grande, M. Rosso, E.J. Pallavicini

Influence of an appropriate balance of the alloying elements on microstructure and on mechanical properties of nodular cast iron 293
R.A. Gonzaga, J.F. Carrasquilla

Development of alternative as-rolled alloys to replace quenched and tempered steels with tensile strength in the range of 600–800 MPa 298
A.A. Gorni, P.R. Mei

Influence of deformation sequence of monotonic tests on behaviour of CuSi3.5 bronze 304
Z. Gronostajski, K. Jaśkiewicz

Effect of superheating temperatures on microstructure and properties of strontium modified aluminium–silicon eutectic alloy 312
M.M. Haque, A.F. Ismail

Optical and mechanical properties of an Al–Mg alloy processed by ECAE 317
B. Huarte, C.J. Luis, I. Puertas, J. León, R. Luri

Evaluation of retained austenite stability in heat treated cold work tool steel 327
A. Kokosza, J. Pacyna

Role of the intermetallic phases in technological process of fixture brasses 332
M. Kondracki, J. Gawroński, J. Szajnar

The influence of hypereutectoid cementite morphology upon fracture toughness of chromium–nickel–molibdenium cast steel of ledeburite class 336
J. Krawczyk, E. Rożniata, J. Pacyna

The influence of niobium and aging treatment in the 18% Ni maraging steel 342
D.G. Lee, K.C. Jang, J.M. Kuk, I.S. Kim

Processing and properties of C–Mn steel with dual-phase microstructure 350
J. Lis, A.K. Lis, C. Kolan

Effect of Al_3Sc precipitate on the microstructural evolution during accumulative roll bonding in Al–0.2 wt.% Sc alloy 355
B.K. Min, H.W. Kim, S.B. Kang

The effect of tempering on low cycle fatigue behavior of Al-2024 362
A. Mohamed, Y. El-Madhoun, M.N. Bassim

Influence of heat treatment on the microstructure and mechanical properties of 6005 and 6082 aluminium alloys 367
G. Mrówka-Nowotnik, J. Sieniawski

Structure and properties of Fe–6.67% C alloy obtained by mechanical alloying 373
R. Nowosielski, W. Pilarczyk

The effect of ductility minimum temperature in CuNi25 alloy 379
R. Nowosielski, P. Sakiewicz, P. Gramatyka

Effect of high strain rate on plastic deformation of a low alloy steel subjected to ballistic impact 385
A.G. Odeshi, S. Al-ameeri, M.N. Bassim

The relationship between hot ductility and intergranular fracture in a CuSn6P alloy at elevated temperatures 392
W. Ozgowicz

The effect of raw material fabrication process on microstructural characteristics in reheating process for semi-solid forming 402
P.K. Seo, C.G. Kang

Relationship between microstructure of laser alloyed C45 steel and its cavitation resistance 410
M. Szkodo

Compressive deformation behaviour of magnesium alloys 416
Z. Trojanová, P. Lukáč

The course of the peritectic transformation in the Al-rich Al–Fe–Mn–Si alloys 422
M. Warmuzek, K. Rabczak, J. Sieniawski

EBSD characterization of cavitation during superplastic deformation of Al–Li alloy 429
Y. Xun, M.J. Tan, K.M. Liew

Grain refinement of LM6 Al–Si alloy sand castings to enhance mechanical properties 435
L.Y. Pio, S. Sulaiman, A.M. Hamouda, M.M.H.M. Ahmad

The kinetics of phase transformations during tempering in structural steels with nickel 442
G. Zając, J. Pacyna

Micro-cracking of low carbon steel in hot-forming processes 447
J. Zhang, H.-C. Kwon, H.-Y. Kim, S.-M. Byon, H.-D. Park, Y.-T. Im

Prediction of formability extension in deep drawing when superimposing a thermal gradient 454
G. Ambrogio, L. Filice, G. Palumbo, S. Pinto

Types of mid-frequency vibrations appearing during the rolling mill operation 461
A. Bar, O. Bar

Charge materials and technology of melt and structure of gray cast iron 465
D. Bartocha, K. Janerka, J. Suchoń

An experimental study on the forming parameters of deep-drawable steel sheets in automotive industry 471
E. Bayraktar, N. Isac, G. Arnold

Method for generation of rheological model to characterize non-conventional injection molding by means of spiral mold 477
I. Clavería, C. Javierre, L. Ponz

Thermo-mechanical stresses in cast steel dies during glass pressing process 484
G. Dusserre, F. Schmidt, G. Dour, G. Bernhart

Deformation analysis for the shear bending process of circular tubes 492
M. Goodarzi, T. Kuboki, M. Murata

Effect of processing temperature on warm shot peening of spring steel 498
Y. Harada, K. Mori

Microstructure prediction of Nimonic 80A for large exhaust valve during hot closed die forging 504
H.S. Jeong, J.R. Cho, H.C. Park

Study of work roll edge contact in asymmetrical rolling by modified influence function method 512
Z.Y. Jiang, H.T. Zhu, A.K. Tieu

Cavity minimization and uniformity studies on superplastic forming of thin eutectic Pb–Sn sheet by optimum loading and preforming 519
K. Kalaichelvan, R. Sivaramakrishnan, D. Dinakaran, A.J. Stanley

Development of a new burr-free hydro-mechanical punching 524
S.S. Kim, C.S. Han, Y.-S. Lee

Influence of resin dies and resin auxiliary sheets on deep drawability of metal foil 530
Y. Marumo, H. Saiki, L. Ruan

Chill material and size effects on HTC evolution in sand casting of aluminum alloys 534
A. Meneghini, L. Tomesani

Compression spinning of circular magnesium tube using heated roller tool 540
M. Murata, T. Kuboki, T. Murai

Numerical analysis of the vertical vibrations of rolling mills and their negative effect on the sheet quality 546
J. Nizioł, A. Świątoniowski

Calculation of the forward tension in drawing processes 551
E.M. Rubio, A.M. Camacho, L. Sevilla, M.A. Sebastián

Use of SLFET for design of flash gap with V-notched lands in a closed-die forging 558
G. Samołyk, Z. Pater

Differential heating forming of solid and bi-metallic hollow parts 564
K.L. Schlemmer, F.H. Osman

The characteristics of grain size controlled microstructure and mechanical properties of Al-Si alloy by thixocasting and rheocasting process 570
P.K. Seo, D.U. Kim, C.G. Kang

Deformation analysis of surface flaws in stainless steel wire drawing 579
T. Shinohara, K. Yoshida

Adaptive calculation of deformation resistance model of online process control in tandem cold mill 585
J.S. Wang, Z.Y. Jiang, A.K. Tieu, X.H. Liu, G.D. Wang

Modelling of the micro-segregation of twin-roll thin strip casting 591
X.M. Zhang, Z.Y. Jiang, X.H. Liu, G.D. Wang

High-speed end-milling of AISI 304 stainless steels using new geometrically developed carbide inserts 596
K.A. Abou-El-Hossein, Z. Yahya

Machinability of 90MnCrV8 steel during high-speed machining 603
S. Ekinović, S. Dolinšek, E. Begović

Machining of nickel-base, Inconel 718, alloy with ceramic tools under finishing conditions with various coolant supply pressures 609
E.O. Ezugwu, J. Bonney, D.A. Fadare, W.F. Sales

High-speed precise machine tools spindle units improving 615
J. Jędrzejewski, Z. Kowal, W. Kwaśny, W. Modrzycki

Incremental sheet metal forming on CNC milling machine-tool 622
J. Kopac, Z. Kampus

Design of grinding factors based on response surface methodology 629
P. Krajnik, J. Kopac, A. Sluga

ED machining of WC–Co 637
R.A. Mahdavinejad, A. Mahdavinejad

Study of roundness on cylindrical bars turned of aluminium–copper alloys UNS A92024 644
M. Marcos-Bárcena, M.A. Sebastián-Pérez, J.P. Contreras-Samper, M. Sánchez-Carrilero, M. Sánchez-López, J.M. Sánchez-Sola

Effect of lubrication and cutting parameters on ultrasonically assisted turning of Inconel 718 649
A.V. Mitrofanov, N. Ahmed, V.I. Babitsky, V.V. Silberschmidt

FBF-NN-based modelling of cylindrical plunge grinding process using a GA 655
A.K. Nandi, M.K. Banerjee

Characterisation of the wear behaviour of polycrystalline diamond (PCD) tools when machining wood-based composites 665
P. Philbin, S. Gordon

Error compensation strategy in milling flexible thin-wall parts 673
S. Ratchev, S. Liu, A.A. Becker

Surface roughness of AA7050 alloy turned bars. Analysis of the influence of the length of machining 682
E.M. Rubio, A.M. Camacho, J.M. Sánchez-Sola, M. Marcos

Float polishing technique using new tool consisting of micro magnetic clusters 690
K. Shimada, Y. Wu, Y. Matsuo, K. Yamamoto

Analysis of factors affecting the high-speed side milling of hardened die steels 696
J. Vivancos, C.J. Luis, J.A. Ortiz, H.A. González

A study on roughness of the micro-end-milled surface produced by a miniatured machine tool 702
W. Wang, S.H. Kweon, S.H. Yang

A new centerless grinding technique using a surface grinder 709
Y. Wu, T. Kondo, M. Kato

Implementation of APQP-concept in design of QMS 718
M. Bobrek, M. Sokovic

The specialities of fibre-reinforced plastics in terms of product lifecycle management 725
J. Broekel, G. Scharr

Development of a programme system for data-point pre-processing in Reverse Engineering 730
I. Budak, J. Hodolic, M. Sokovic

Quality estimation of process with usage control charts type X-R and quality capability of process C_p, C_{pk} 736
M. Dudek-Burlikowska

Use of machines for liquid manure aerating and mixing 744
M. Janzekovic, B. Mursec, F. Cus, T. Ploj, I. Janzekovic, U. Zuperl

The usage of The Balanced Scorecard for the estimation of the enterprise's effectiveness 751
J. Michalska

Environmental management inside production systems 759
K. Mijanovic, J. Kopac

Multiscale model of segregation process 766
B. Mochnacki, S. Lara, E. Pawlak

Chosen aspects of evaluation of productive processes on the example of productive chains of sections type V29 770
M. Roszak, S. Tkaczyk

Application of Six Sigma methodology for process design 777
M. Sokovic, D. Pavletic, S. Fakin